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3049

DRINKING WATER SURVEILLANCE PROGRAM

**ORANGEVILLE  
WELL SUPPLY**

REPORT FOR 1991 AND 1992



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**ORANGEVILLE WELL SUPPLY  
DRINKING WATER SURVEILLANCE PROGRAM  
REPORT FOR 1991 AND 1992**

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PIBS 3049



## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM

#### ORANGEVILLE WELL SUPPLY 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Orangeville well supply is a ground water source and consists of 10 wells which collect and pump water from several aquifers. Iron/manganese sequestering is practiced and the water is disinfected. The maximum pumping capacity of the system is 15.3 x 1000 m<sup>3</sup>/day. The Orangeville well supply serves a population of approximately 19,000.

Raw water at the 10 wells, treated water from the reservoir and one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Orangeville well supply, for the sample year 1992, produced good quality water and this was maintained in the distribution system.

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A ' ' ' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	WELL 8A RAW TESTS	POSITIVE	%POSITIVE	WELL 8B RAW TESTS	POSITIVE	%POSITIVE	WELL 8C RAW TESTS	POSITIVE	%POSITIVE	WELL 2 PRETREATED TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	6	2	33	6	1	16	3	0	0	6	1	16
CHEMISTRY (FIELD)	4	4	100	4	4	100	3	3	100	4	4	100
CHEMISTRY (LABORATORY)	46	33	71	46	38	82	23	17	73	46	34	73
METALS	48	17	35	48	19	39	24	8	33	48	19	39
CHLOROAROMATICS	28	0	0	28	0	0	14	0	0	28	0	0
PESTICIDES AND PCB	70	0	0	70	0	0	35	0	0	70	0	0
PHENOLICS	2	0	0	2	0	0	1	0	0	2	0	0
VOLATILES	62	0	0	62	0	0	31	0	0	62	0	0
RADIONUCLIDES	7	1	14	7	0	0	7	2	28	7	2	28
TOTAL	273	57		273	62		141	30		273	60	

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	WELL 3 PRETREATED TESTS	POSITIVE	%POSITIVE	WELL 4 PRETREATED TESTS	POSITIVE	%POSITIVE	WELL 5 PRETREATED TESTS	POSITIVE	%POSITIVE	WELL 5A PRETREATED TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	6	1	16	9	1	11	9	1	11	3	0	0
CHEMISTRY (FIELD)	4	4	100	7	7	100	7	7	100	2	2	100
CHEMISTRY (LABORATORY)	46	35	76	69	56	81	69	48	69	23	15	65
METALS	48	19	39	72	36	50	72	16	22	24	8	33
CHLOROAROMATICS	28	0	0	42	0	0	42	0	0	14	0	0
PESTICIDES AND PCB	70	0	0	105	0	0	105	0	0	35	0	0
PHENOLICS	2	0	0	3	0	0	3	0	0	1	0	0
VOLATILES	62	0	0	93	3	3	93	0	0	31	0	0
RADIONUCLIDES	7	2	28	7	2	28	7	2	28	.	.	.
TOTAL	273	61		407	105		407	74		133	25	

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	WELL 6 PRETREATED		WELL 7 PRETREATED		RESERVOIR TREATED		DIST. SYSTEM KENSINGTON PL	
	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE
BACTERIOLOGICAL	9	0	0	16	5	2	40	0
CHEMISTRY (FIELD)	6	6	100	4	26	26	100	42
CHEMISTRY (LABORATORY)	69	56	81	36	120	92	76	151
METALS	72	32	44	20	120	43	35	207
CHLOROAROMATICS	42	0	0	0	70	0	0	84
PESTICIDES AND PCB	105	0	0	0	175	0	0	132
PHENOLICS	3	0	0	0	5	0	0	.
POLYAROMATIC HYDROCARBONS	.	.	.	.	17	0	0	0
VOLATILES	93	0	0	0	155	19	12	186
RADIONUCLIDES	7	2	28	1	7	2	28	.
TOTAL	406	96	273	62	700	184	863	294

## DRINKING WATER SURVEILLANCE PROGRAM

### ORANGEVILLE WELL SUPPLY 1992 REPORT

#### INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Orangeville well supply in August 1992. This is the first published annual report.

#### PLANT DESCRIPTION

The Orangeville well supply is a ground water source and consists of 10 wells which collect and pump water from several aquifers. Iron/manganese sequestering is practiced and the water is disinfected. The maximum pumping capacity of the system is  $15.3 \times 1000 \text{ m}^3/\text{day}$ . The Orangeville well supply serves a population of approximately 19,000.

The sample day flows were not reported for this sampling period.

General information for the water supply is presented in Table 1.

#### SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines at the wells and reservoir were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Municipal operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service

connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Raw water at 10 wells, treated water from the reservoir and one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

## RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 (when data is provided) contains information on flow rate and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

In Table 4, a "pretreated" sample refers to a raw water sample collected prior to the addition of treatment chemicals where the treated water flows directly into the distribution system and a representative treated water sample could not be obtained.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

## DISCUSSION

### GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

#### **IN REPORTS FOR GROUND WATER SUPPLIES, WHERE:**

- TREATMENT CAN BE LIMITED TO DISINFECTION;
- MANY WELLS CAN FEED INTO THE DISTRIBUTION SYSTEM INDEPENDENTLY; AND
- TREATED SAMPLES, WHEN AVAILABLE, ARE TAKEN FROM RESERVOIRS;

#### **THIS SECTION WILL DISCUSS:**

- RESULTS FROM RAW, PRETREATED, TREATED AND DISTRIBUTED WATERS;
- THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND
- POSITIVE ORGANIC PARAMETERS DETECTED.

### BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

### INORGANIC & PHYSICAL

#### **CHEMISTRY (FIELD)**

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in

late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 1 distributed water sample with a maximum reported value of 21°C. This sample was probably not flushed adequately.

#### CHEMISTRY (LABORATORY)

Calcium exceeded the European Economic Community Aesthetic Guideline Level of 100 mg/L in 2 pretreated water samples with a maximum reported value of 110.4 mg/L.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in all 26 pretreated, treated and distributed water samples with a maximum reported value of 818 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L with values greater than 200 mg/L in all 26 pretreated, treated and distributed water samples with a maximum reported value of 413.7 mg/L.

Magnesium exceeded the European Economic Community Aesthetic Guideline Level of 30 mg/L in 2 pretreated water samples with a maximum reported value of 33.4 mg/L.

Total ammonium exceeded the European Economic Community Aesthetic Guideline Level of 0.05 mg/L in 3 pretreated water samples with a maximum reported value of 0.066 mg/L.

Dissolved solids (residue filtrate in Table 4) exceeded the ODWO Aesthetic Objective of 500 mg/L in 1 pretreated water sample with a maximum reported value of 538 mg/L.

The numerous minerals and salts detected above aesthetic guidelines is characteristic of many groundwater sources.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment

plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Unit (FTU) and applies to the water leaving the treatment facility.

Turbidity exceeded the ODWO Maximum Acceptable Concentration of 1.0 FTU in 1 of 5 treated water samples from the reservoir with a reported value of 1.45 FTU. The corresponding and more reliable field turbidity result was not above the guideline. In ground water samples, turbidity can increase if the samples are not analyzed immediately in the field. This is frequently caused by precipitating iron but can also be due to precipitates formed from sulphides or calcium. The District Officer was advised of the situation.

#### METALS

The results of the metals scan showed that none were detected above the guidelines.

#### ORGANIC

##### CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected.

##### CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

##### PESTICIDES AND PCB

The results of the pesticides and PCB scan showed that none were detected.

##### PHENOLICS

The results of the phenolic test showed that none were detected above trace levels.

##### POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

##### SPECIFIC PESTICIDES

The specific pesticide scan was not requested during this sampling period.

## VOLATILES

Trichloroethylene was found at positive levels in 3 pretreated water samples from one well. The maximum observed level was 3.6 ug/L. This was below the ODWO Maximum Acceptable Concentration of 50 ug/L.

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in 4 of 10 treated and distributed water samples analyzed. The maximum observed level was 7.95 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

## RADIOLOGICAL

### RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

## CONCLUSIONS

No known health related guidelines were exceeded.

The Orangeville well supply, for the sample year 1992, produced good quality water and this was maintained in the distribution system.

TABLE 1  
 DRINKING WATER SURVEILLANCE PROGRAM  
 PLANT GENERAL REPORT

PLANT NAME: ORANGEVILLE WELL SUPPLY  
 WORKS #: 220003252  
 UTM #: 1705716854860910

DISTRICT: CAMBRIDGE  
 REGION: WEST CENTRAL  
 DISTRICT OFFICER: J. TAYLOR

CHIEF OPERATOR: R. LONG

ADDRESS: 500 "C" LINE  
 ORANGEVILLE, ONTARIO  
 519-941-2671

MUNICIPALITY: ORANGEVILLE  
 AUTHORITY: MUNICIPAL

PLANT INFORMATION

MAXIMUM PUMPING CAPACITY:	15.314	(X 1000 M3)
DESIGN CAPACITY:	-	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
ORANGEVILLE	19,000

TABLE 2  
DRINKING WATER SURVEILLANCE PROGRAM  
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
TOTAL CHLORINE RESIDUAL	TREATED	DAILY
TEMPERATURE	RAW	MONTHLY
TURBIDITY	RAW	2 TIMES/WEEK
	TREATED	2 TIMES/WEEK

KEY TO TABLE 4 and 5

- A     ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
  - 1+. MAC for Total Trihalomethanes
  2. Interim Maximum Acceptable Concentration (IMAC)
  3. Aesthetic Objective (AO)
  - 3\*. AO for Total Xylenes
  4. Recommended Operational Guideline
  5. Health Related Guidance Value
- B     HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
  2. Proposed MAC
  3. Interim MAC
  4. Aesthetic Objective (AO)
- C     WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
  2. Tentative GV
  3. Aesthetic GV
- D     US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
  2. Suggested No-Adverse Effect Level (SNAEL)
  3. Lifetime Health Advisory
  4. EPA Ambient Water Quality Criteria
- F     EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
  2. Aesthetic Guideline Level
  3. Maximum Admissible Concentration (MADC)
- G     CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I     NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A   NONE AVAILABLE

## LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!48	No Data: Sample Age Exceeded 48 Hours
!AR	No Data: No Numeric Results
!AW	No Data: Analysis Withdrawn
!BT	No Data: Sample Broken In Transit
!CS	No Data: Contamination Suspected
!EF	No Data: Laboratory Equipment Failure
!IR	No Data: Insufficient Sample
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedure Error: Sample Discarded
!PR	No Data: Preservative Required
!QU	No Data: Quality Control Unacceptable
!RE	No Data: Received Empty
!RO	No Data: No Numeric Results
!SM	No Data: Sample Missing
!SS	No Data: Sample Improperly Preserved
!U	No Data: Sample Unsuitable For Analysis
!UB	No Data: Bottle Broken
!UN	No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
BACTERIOLOGICAL							
FECAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0		GUIDELINE = 0 (A1)				
1992 AUG	0	0	0	0	0	0	0
1992 SEP	0	0	0	0	0	0	0
1992 OCT	0	0	0	0	0	0	0
1992 NOV	0	0	0	0	0	0	0
1992 DEC	0	0	0	0	0	0	0
TOTAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)				
1992 AUG	0	0	0	0	0	0	0
1992 SEP	0	0	0	0	0	0	0
1992 OCT	0	0	0	0	0	0	0
1992 NOV	0	0	0	0	0	0	0
1992 DEC	0	0	0	0	0	0	0
T COLIFORM BCKGRD MF (CT/100ML)	DET'N LIMIT = 0		GUIDELINE = N/A				
1992 AUG	30	0	33	1	0	0	0
1992 SEP	58	0	0	0	0	2	0
1992 OCT	5	0	0	0	0	0	0
1992 NOV	0	0	0	0	1	0	0
1992 DEC	0	0	0	0	0	0	0

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING	
BACTERIOLOGICAL					
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)	
1992 AUG	0	.	.	.	.
1992 SEP	.	.	.	.	.
1992 OCT	0	.	.	.	.
1992 NOV	0	.	.	.	.
1992 DEC	0	.	.	.	.
STANDRO- PLATE CNT. MF (CT/ML)					
		DET'N LIMIT = 0		GUIDELINE = 500 (A3)	
1992 AUG	.	39	4 <=>	.	.
1992 SEP	.	73	2 <=>	.	.
1992 OCT	.	3 <=>	6 <=>	6 <=>	.
1992 NOV	.	1 <=>	1 <=>	.	.
1992 DEC	.	3 <=>	0 <=>	.	.
TOTAL COLIFORM MF (CT/100ML)					
		DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)	
1992 AUG	0	.	.	.	.
1992 SEP	.	.	.	.	.
1992 OCT	0	.	.	.	.
1992 NOV	0	.	.	.	.
1992 DEC	0	.	.	.	.
T. COLIFORM BCKGRD MF (CT/100ML)					
		DET'N LIMIT = 0		GUIDELINE = N/A	
1992 AUG	0	.	.	.	.
1992 SEP	.	.	.	.	.
1992 OCT	0	.	.	.	.
1992 NOV	0	.	.	.	.
1992 DEC	0	.	.	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHEMISTRY (FIELD)							
FLD PH (DMNSLESS)	DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)				
1992 AUG	7.350	.	.	.	7.200	7.200	.
1992 SEP	.	.	7.200	7.000	.	.	7.200
1992 OCT	.	7.400	.	.	7.000	7.200	.
1992 NOV	7.200	.	7.200	7.200	.	.	.
1992 DEC	7.200	.	.	.	7.000	7.200	.
FLD TEMPERATURE (DEG.C)	DET'N LIMIT = N/A		GUIDELINE = 15 (A3)				
1992 OCT	.	8.200	.	.	8.500	11.000	.
FLD TURBIDITY (FTU)	DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)				
1992 AUG	.300	.	.	.	.900	.020	.
1992 SEP	.	.	.460	5.500	.	.	.290
1992 OCT	.280	.760	.	.	.350	.360	.
1992 NOV	.560	.	.580	.760	.	.	.
1992 DEC	1.030	.	.	.	.740	.200	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING	
CHEMISTRY (FIELD)					
FLD CHLORINE (COMB) (MG/L )		DET'N LIMIT = 0		GUIDELINE = N/A	
1992 AUG	.	.030	.060	.	.
1992 SEP	.	.060	.060	.	.
1992 OCT	.	.070	.110	.	.
1992 NOV	.	.060	.030	.	.
1992 DEC	.	.140	.060	.	.
FLD CHLORINE FREE (MG/L )					
		DET'N LIMIT = 0		GUIDELINE = N/A	
1992 AUG	.	.680	.620	.	.
1992 SEP	.	.280	.150	.	.
1992 OCT	.	.580	.250	.	.
1992 NOV	.	.430	.400	.	.
1992 DEC	.	.350	.330	.	.
FLD CHLORINE (TOTAL) (MG/L )					
		DET'N LIMIT = 0		GUIDELINE = N/A	
1992 AUG	.	.710	.680	.	.
1992 SEP	.	.340	.210	.	.
1992 OCT	.	.650	.360	.	.
1992 NOV	.	.490	.430	.	.
1992 DEC	.	.490	.390	.	.
FLD PH (DMNSLESS )					
		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1992 AUG	7.200	7.200	7.400	.	.
1992 SEP	.	7.400	7.400	.	.
1992 OCT	7.200	7.400	7.400	7.400	.
1992 NOV	.	7.400	7.200	7.200	.
1992 DEC	7.000	7.400	7.400	7.400	.
FLD TEMPERATURE (DEG.C )					
		DET'N LIMIT = N/A		GUIDELINE = 15 (A3)	
1992 OCT	.	8.500	21.000	21.000	.
FLD TURBIDITY (FTU )					
		DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)	
1992 AUG	.200	.600	.700	.	.
1992 SEP	.	.590	.370	.	.
1992 OCT	.120	.430	.530	.530	.
1992 NOV	.580	1.000	.650	.650	.
1992 DEC	.230	.580	.430	.550	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

	WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHEMISTRY (LABORATORY)								
ALKALINITY (MG/L)								
			DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)				
1992 AUG	233.200					297.000	240.300	
1992 SEP		229.100		255.100	254.700			244.100
1992 OCT			227.400			296.800	246.400	
1992 NOV	244.900			241.100	247.600			
1992 DEC		145.000				131.000	151.000	
CALCIUM (MG/L)								
			DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)				
1992 AUG	69.180					110.460	83.520	
1992 SEP		60.550		81.100	80.900			78.550
1992 OCT			62.600			104.800	84.400	
1992 NOV	69.000			75.700	74.500			
1992 DEC		50.550				54.400	58.750	
CHLORIDE (MG/L)								
			DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)				
1992 AUG	4.600					46.000	54.900	
1992 SEP		3.400		24.500	12.100			51.800
1992 OCT			3.200			37.800	61.800	
1992 NOV	4.100			24.600	11.600			
1992 DEC		4.800				32.400	70.900	
COLOUR (NZU)								
			DET'N LIMIT = 0.50	GUIDELINE = 5 (A3)				
1992 AUG	1.500					1.000 <T	BDL	
1992 SEP		1.500		1.000 <T	3.500			BDL
1992 OCT			1.000 <T			2.500	.500 <T	
1992 NOV	1.000 <T			1.000 <T	2.000			
1992 DEC		1.000 <T				2.000	1.000 <T	
CONDUCTIVITY (UMHO/CM)								
			DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)				
1992 AUG	484					818	684	
1992 SEP		463		615	575			666
1992 OCT			451			740	690	
1992 NOV	483			596	556			
1992 DEC		346				530	582	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHEMISTRY (LABORATORY)				
DET'N LIMIT = 0.2				
GUIDELINE = 30-500 (A4)				
ALKALINITY (MG/L)				
1992 AUG	253.700	235.800	237.200	
1992 SEP		243.000	242.400	243.700
1992 OCT	237.000	239.500	242.600	239.500
1992 NOV	231.200	235.500	242.600	247.100
1992 DEC	108.100	219.000	237.800	237.200
DET'N LIMIT = 0.20				
GUIDELINE = 100 (F2)				
CALCIUM (MG/L)				
1992 AUG	96.540	69.060	69.600	
1992 SEP		65.300	67.700	65.350
1992 OCT	68.350	69.500	68.000	69.000
1992 NOV	65.600	66.400	74.400	75.700
1992 DEC	50.800	68.100	66.400	65.950
DET'N LIMIT = 0.001				
GUIDELINE = 0.2 (A1)				
CYANIDE (MG/L)				
		BDL		
DET'N LIMIT = 0.20				
GUIDELINE = 250 (A3)				
CHLORIDE (MG/L)				
1992 AUG	11.000	5.400	5.300	
1992 SEP		5.100	5.100	5.200
1992 OCT	5.600	6.700	6.700	6.800
1992 NOV	5.400	5.100	13.000	14.100
1992 DEC	12.600	5.100	5.400	5.300
DET'N LIMIT = 0.50				
GUIDELINE = 5 (A3)				
COLOUR (HZU)				
1992 AUG	1.500	2.000	2.500	
1992 SEP		2.000	2.000	1.000 <T
1992 OCT	4.500	1.500	.500 <T	.500 <T
1992 NOV	2.000	1.000 <T	BDL	BDL
1992 DEC	2.000	1.500	1.000	.500 <T
DET'N LIMIT = 1.0				
GUIDELINE = 400 (F2)				
CONDUCTIVITY (UMHO/CM)				
1992 AUG	623	492	491	
1992 SEP		488	485	488
1992 OCT	607	485	488	486
1992 NOV		495	528	539
1992 DEC	461	473	488	485

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHEMISTRY (LABORATORY)							
DET'N LIMIT = 0.10      GUIDELINE = 5.0 (A3)							
DISS ORG CARBON (MG/L)							
1992 AUG	.300 <T		.200 <T		1.100	.400 <T	.200 <T
1992 SEP	.500						
1992 OCT		.300 <T			.900	.500	
1992 NOV	.400 <T		.400 <T				
1992 DEC					.900	.400 <T	
DET'N LIMIT = 0.01      GUIDELINE = 1.5 (A1)							
FLUORIDE (MG/L)							
1992 AUG	.160				.180	.140	.120
1992 SEP	.260		.200				
1992 OCT		.280			.160	.120	
1992 NOV	.140		.220		.140		
1992 DEC	.200				.200	.140	
DET'N LIMIT = 0.5      GUIDELINE = 80-100 (A4)							
HARDNESS (MG/L)							
1992 AUG	270.000				413.760	313.000	301.320
1992 SEP			310.480	313.090			
1992 OCT	307.160				398.000	315.000	
1992 NOV		249.000	293.000	293.000			
1992 DEC	171.100				220.590	226.190	
DET'N LIMIT = N/A      GUIDELINE = N/A							
IONCAL (DMNSLESS)							
1992 AUG	2.141				2.381	1.179	
1992 SEP			2.452	1.004			2.484
1992 OCT	4.101				1.587	.618	
1992 NOV		2.078	4.320	4.826			
1992 DEC	4.484				4.497	3.871	
DET'N LIMIT = 0.01      GUIDELINE = 10 (F2)							
POTASSIUM (MG/L)							
1992 AUG	1.082				1.921	1.532	
1992 SEP			1.249	1.238			1.499
1992 OCT	1.096				1.850	1.530	
1992 NOV		1.120		1.207			
1992 DEC	1.042		1.234		1.754	1.493	
DET'N LIMIT = N/A      GUIDELINE = N/A							
LANGELIERS INDEX (DMNSLESS)							
1992 AUG	1.018				1.104	1.107	
1992 SEP			1.194	1.086			1.148
1992 OCT		.987			1.105	1.042	
1992 NOV	1.179		1.011	1.030			
1992 DEC	.659				.519	.649	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHEMISTRY (LABORATORY)				
OISS ORG CARBON (MG/L )		DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)
1992 AUG	.700	.400 <T	.400 <T	.300 <T
1992 SEP		.300 <T	.400 <T	.700
1992 OCT	1.100	.400 <T	.600	.500
1992 NOV	.600	.400 <T	.600	.500
1992 DEC	.900	.600	.600	.500
FLUORIDE (MG/L )				
		DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)
1992 AUG	.140	.180	.180	.180
1992 SEP		.180	.180	.160
1992 OCT	.120	.160	.160	.160
1992 NOV	.160	.220	.220	.240
1992 DEC	.140	.220	.220	
HARDNESS (MG/L )				
		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)
1992 AUG	349.000	269.000	271.600	260.460
1992 SEP		260.800	265.310	270.000
1992 OCT	345.000	271.000	268.000	290.000
1992 NOV		261.600	287.000	261.460
1992 DEC	189.630	238.700	262.660	
IRONAL (OMNSLESS )				
		DET'N LIMIT = N/A		GUIDELINE = N/A
1992 AUG	3.241	1.144	1.718	4.668
1992 SEP		4.596	2.541	.130
1992 OCT	.539	.495	1.839	2.078
1992 NOV		.777	1.265	1.976
1992 DEC	4.472	4.088	2.430	
POTASSIUM (MG/L )				
		DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)
1992 AUG	1.197	1.279	1.267	1.226
1992 SEP		1.256	1.245	1.300
1992 OCT	1.180	1.260	1.290	1.169
1992 NOV		1.454	1.141	1.205
1992 DEC	1.173	1.223	1.179	
LANGELIERS INDEX (OMNSLESS )				
		DET'N LIMIT = N/A		GUIDELINE = N/A
1992 AUG	1.127	1.082	1.118	1.202
1992 SEP		1.191	1.216	1.079
1992 OCT	1.069	1.072	1.108	1.207
1992 NOV	.971	1.186	1.193	.945
1992 DEC	.433	.975	.939	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 88 RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHEMISTRY (LABORATORY)							
MAGNESIUM (MG/L )	DET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)				
1992 AUG	23.520				33.400	25.260	
1992 SEP			26.220	27.000			25.560
1992 OCT		22.400			33.100	25.400	
1992 NOV	23.100		25.300	26.000			
1992 DEC					20.580	19.320	
SODIUM (MG/L )	DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)				
1992 AUG	3.090				21.640	23.640	
1992 SEP			12.710	5.080			22.920
1992 OCT	3.290	3.200			17.500	29.000	
1992 NOV			11.930	4.710			
1992 DEC	3.320				15.400	26.040	
AMMONIUM TOTAL (MG/L )	DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)				
1992 AUG	80L				.054	80L	.004 <T
1992 SEP			.012	.028			
1992 OCT		.016			.062	80L	
1992 NOV	80L		.014	.026			
1992 DEC					.066	.006 <T	
NITRITE (MG/L )	DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)				
1992 AUG	.001 <T				.003 <T	.003 <T	
1992 SEP			.001 <T	.001 <T			.001 <T
1992 OCT		.002 <T			.003 <T	.002 <T	
1992 NOV	80L		.003 <T	.002 <T			
1992 DEC					.002 <T	.001 <T	
NITRATE (TOTAL) (MG/L )	DET'N LIMIT = 0.005		GUIDELINE = 10.0 (A1)				
1992 AUG	.010 <T				80L	4.470	
1992 SEP			1.760				4.460
1992 OCT		.050			80L	4.430	
1992 NOV			1.720				
1992 DEC	.045				80L	4.500	
NITROGEN TOT KJELD (MG/L )	DET'N LIMIT = 0.02		GUIDELINE = N/A				
1992 AUG	.040 <T				.130	.080 <T	
1992 SEP			.050 <T	.040 <T			.070 <T
1992 OCT		.020 <T			.110	.070 <T	
1992 NOV	.040 <T		.090 <T	.070 <T			
1992 DEC					.120	.080 <T	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHEMISTRY (LABORATORY)				
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)	
1992 AUG	26.160	23.340	23.700	.
1992 SEP	.	23.760	23.400	23.640
1992 OCT	24.540	23.600	23.900	23.800
1992 NOV	24.200	23.200	24.500	24.500
1992 DEC	15.240	16.680	23.520	23.520
SODIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)	
1992 AUG	5.240	4.220	4.280	.
1992 SEP	.	3.770	3.780	4.260
1992 OCT	3.410	4.320	5.080	5.040
1992 NOV	3.230	4.280	7.030	7.320
1992 DEC	5.480	4.100	4.040	4.080
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)	
1992 AUG	.010	BOL	BOL	.
1992 SEP	.012	.006 <T	.004 <T	.012
1992 OCT	.014	BOL	.002 <T	.022 <T
1992 NOV	.012	.002 <T	.004 <T	.012
1992 DEC	.020	.006 <T	.006 <T	.010
NITRITE (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 1.0 (A1)	
1992 AUG	.003 <T	BOL	BOL	.
1992 SEP	.002 <T	BOL	BOL	.001 <T
1992 OCT	.003 <T	BOL	.002 <T	.002 <T
1992 NOV	.001 <T	BOL	.001 <T	.002 <T
1992 DEC	.002 <T	BOL	BOL	.002 <T
NITRATE (TOTAL) (MG/L)		DET'N LIMIT = 0.005	GUIDELINE = 10.0 (A1)	
1992 AUG	.015 <T	.020 <T	.020 <T	.
1992 SEP	.005 <T	.020 <T	.015 <T	.020 <T
1992 OCT	.025	.015 <T	.020 <T	.020 <T
1992 NOV	BOL	.025	.625	.850
1992 DEC	.030	.040	.030	.060
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02	GUIDELINE = N/A	
1992 AUG	.060 <T	.020 <T	.020 <T	.
1992 SEP	.030 <T	.020 <T	.020 <T	.050 <T
1992 OCT	.060 <T	.030 <T	.080 <T	.110 <T
1992 NOV	.050 <T	.020 <T	.050 <T	.060 <T
1992 DEC	.080 <T	.040 <T	.030 <T	.050 <T

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHEMISTRY (LABORATORY)							
PH (DMINSLESS )							
			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A4)			
1992 AUG	8.270				8.070	8.280	
1992 SEP		8.390		8.350			8.340
1992 OCT			8.290		8.090	8.200	
1992 NOV	8.410			8.220			
1992 DEC		8.240			8.130	8.170	
PHOSPHORUS FIL REACT (MG/L )							
			DET'N LIMIT = 0.0005	GUIDELINE = N/A			
1992 AUG	.001 <T				.001 <T	BDL	.002 <T
1992 SEP				.001 <T			
1992 OCT		.004 <T	.003 <T		.001 <T	.001 <T	
1992 NOV	.075			BDL	.002 <T		
1992 DEC		.009			.001 <T	.001 <T	
PHOSPHORUS TOTAL (MG/L )							
			DET'N LIMIT = 0.002	GUIDELINE = 0.40 (F2)			
1992 AUG	.005 <T				BDL	BDL	BDL
1992 SEP				BDL			
1992 OCT		.005 <T			BDL	.003 <T	
1992 NOV	.195			.005 <T	.003 <T		
1992 DEC		.010			.003 <T	BDL	
RESIDUE FILTRATE (MG/L )							
			DET'N LIMIT = N/A	GUIDELINE = 500 (A3)			
1992 AUG	315.000 CRO				538.000	445.000 CRO	433.000 CRO
1992 SEP				400.000 CRO			
1992 OCT		301.000 CRO	293.000 CRO		481.000 CRO	448.000 CRO	
1992 NOV	314.000 CRO			387.000 CRO			
1992 DEC		306.000 CRO			463.000 CRO	458.000 CRO	
SULPHATE (MG/L )							
			DET'N LIMIT = 0.20	GUIDELINE = 500 (A3)			
1992 AUG	30.790				86.740	26.760	
1992 SEP		30.470		49.960			27.590
1992 OCT			28.960	55.050	78.340	27.420	
1992 NOV	29.130			53.420			
1992 DEC		33.780			87.660	27.530	
TURBIDITY (FTU )							
			DET'N LIMIT = 0.05	GUIDELINE = 1.0 (A1)			
1992 AUG	1.710				8.900	.130 <T	.240 <T
1992 SEP		.670		.430			
1992 OCT			1.540	4.200	8.600	.250	
1992 NOV	1.100			3.800			
1992 DEC		.940			10.300	.360	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHEMISTRY (LABORATORY)				
PH (OMNLESS )	DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1992 AUG	8.210	8.330	8.360	.
1992 SEP	.	8.450	8.460	.
1992 OCT	8.150	8.310	8.350	.
1992 NOV	.	8.450	8.400	.
1992 DEC	8.150	8.260	8.200	8.210
PHOSPHORUS FIL REACT (MG/L )				
		DET'N LIMIT = 0.0005	GUIDELINE = N/A	
1992 AUG	.001 <T	.145	.	.
1992 SEP	.	.025	.	.
1992 OCT	.001 <T	.096	.	.
1992 NOV	.	.140	.	.
1992 DEC	BDL	.076	.	.
PHOSPHORUS TOTAL (MG/L )				
		DET'N LIMIT = 0.002	GUIDELINE = 0.40 (F2)	
1992 AUG	BDL	.320	.	.
1992 SEP	.	.051	.	.
1992 OCT	.004 <T	.245	.	.
1992 NOV	.	.340	.	.
1992 DEC	.004 <T	.237	.	.
RESIDUE FILTRATE (MG/L )				
		DET'N LIMIT = N/A	GUIDELINE = 500 (A3)	
1992 AUG	405.000 CRO	320.000 CRO	319.000 CRO	.
1992 SEP	.	317.000 CRO	315.000 CRO	.
1992 OCT	330.000 CRO	315.000 CRO	317.000 CRO	317.000 CRO
1992 NOV	322.000 CRO	310.000 CRO	343.000 CRO	316.000 CRO
1992 DEC	399.000 CRO	307.000 CRO	317.000 CRO	350.000 CRO
SULPHATE (MG/L )				
		DET'N LIMIT = 0.20	GUIDELINE = 500 (A3)	
1992 AUG	77.800	31.320	31.390	.
1992 SEP	.	31.460	31.150	31.520
1992 OCT	79.900	32.670	32.510	32.750
1992 NOV	.	30.450	42.220	41.870
1992 DEC	82.670	31.690	32.650	31.100
TURBIDITY (FTU )				
		DET'N LIMIT = 0.05	GUIDELINE = 1.0 (A1)	
1992 AUG	1.900	.870	.910	.
1992 SEP	.	.420	.510	.680
1992 OCT	1.830	.600	.840	.680
1992 NOV	.	1.450 RRV	.500	.550
1992 DEC	2.500	.880	.750	.890

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
METALS							
SILVER (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A			
35 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)			
1992 AUG	5.900				5.100	4.600	4.300
1992 SEP		5.000	4.300	5.900			
1992 OCT			8.200		2.600	1.900	
1992 NOV	3.500		1.700	2.900			
1992 DEC		3.900			1.400	1.700	
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)			
1992 AUG	BDL				4.600	BDL	.160 <T
1992 SEP		BDL		1.300			
1992 OCT		.390 <T	BDL		5.700	.230 <T	
1992 NOV	.420 <T		.200 <T	1.300			
1992 DEC		.420 <T			4.000	BDL	
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)			
1992 AUG	80.000				63.000	64.000	60.000
1992 SEP		72.000	72.000	98.000			
1992 OCT					62.000	72.000	
1992 NOV	89.000		70.000	100.000			
1992 DEC		88.000			55.000	75.000	
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)			
1992 AUG	47.000				79.000	46.000	34.000
1992 SEP		33.000		36.000			
1992 OCT			16.000 <T		39.000	17.000 <T	
1992 NOV	8.600 <T			9.700 <T			
1992 DEC		13.000 <T			28.000	14.000 <T	
BERYLLIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)			
1992 AUG	.080 <T				.120 <T	.070 <T	.060 <T
1992 SEP		BDL	BDL	BDL			
1992 OCT			BDL		BDL	BDL	
1992 NOV	BDL		BDL	BDL			
1992 DEC		BDL			BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
METALS				
SILVER (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = N/A	
ALUMINUM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)	
1992 AUG	4.300	7.000	6.200	.
1992 SEP	.	1.700	1.600	3.100
1992 OCT	5.000	2.700	4.000	.
1992 NOV	2.000	6.100	1.800	1.900
1992 DEC	3.000	3.500	3.200	3.200
ARSENIC (UG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)	
1992 AUG	.510 <T	BDL	BDL	.
1992 SEP	.400 <T	BDL	BDL	.
1992 OCT	.	.550 <T	.550 <T	.520 <T
1992 NOV	1.100	.480 <T	.620 <T	.420 <T
1992 DEC	1.500	.190 <T	.390 <T	.230 <T
BARIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)	
1992 AUG	80.000	77.000	83.000	.
1992 SEP	.	78.000	77.000	81.000
1992 OCT	95.000	89.000	86.000	84.000
1992 NOV	100.000	88.000	87.000	91.000
1992 DEC	85.000	82.000	84.000	88.000
BORON (UG/L)				
		DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)	
1992 AUG	58.000	47.000	22.000	.
1992 SEP	.	9.200 <T	9.500 <T	9.900 <T
1992 OCT	27.000	8.700 <T	13.000 <T	10.000 <T
1992 NOV	23.000	20.000 <T	9.900 <T	9.400 <T
1992 DEC	13.000 <T	12.000 <T	13.000 <T	13.000 <T
BERYLLIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)	
1992 AUG	.100 <T	.100 <T	BDL	.
1992 SEP	.	BDL	BDL	BDL
1992 OCT	.060 <T	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
METALS							
CADMIUM (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)				
1992 AUG	BDL				BDL	BDL	
1992 SEP							BDL
1992 OCT		BDL			BDL	BDL	
1992 NOV	BDL						
1992 DEC	.070 <T				BDL	.090 <T	
COBALT (UG/L)	DET'N LIMIT = 0.02		GUIDELINE = N/A				
1992 AUG	.110 <T					.140 <T	
1992 SEP	.250 <T		.270 <T	.280 <T			.290 <T
1992 OCT		BDL				BDL	
1992 NOV	.040 <T		BDL	BDL			
1992 DEC	.190 <T				.300 <T	.220 <T	
CHROMIUM (UG/L)	DET'N LIMIT = 0.50		GUIDELINE = 50.0 (A1)				
1992 AUG	4.000 <T				6.100	5.000 <T	
1992 SEP	4.700 <T		4.400 <T	4.500 <T			5.600
1992 OCT		2.800 <T			5.400	4.300 <T	
1992 NOV	1.100 <T		2.400 <T	.520 <T			
1992 DEC	2.900 <T				BDL	4.500 <T	
COPPER (UG/L)	DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)				
1992 AUG	1.100 <T				1.500 <T	1.700 <T	
1992 SEP			BDL	BDL			BDL
1992 OCT		BDL			.720 <T	BDL	
1992 NOV	BDL		BDL	BDL			
1992 DEC	.980 <T				BDL	1.200 <T	
IRON (UG/L)	DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)				
1992 AUG	160.000				510.000	BDL	
1992 SEP			44.000 <T	310.000			BDL
1992 OCT	86.000				580.000	BDL	
1992 NOV		120.000					
1992 DEC	83.000		64.000	280.000	510.000	BDL	
MERCURY (UG/L)	DET'N LIMIT = 0.02		GUIDELINE = 1.0 (A1)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING	
METALS					
CADMIUM (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 5.0 (A1)		
1992 AUG	BDL	BDL	BDL		
1992 SEP		BDL	.060 <T	.070 <T	
1992 OCT	BDL	BDL	.060 <T	.090 <T	
1992 NOV	BDL	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	.070 <T	
COBALT (UG/L)					
		DET'N LIMIT = 0.02	GUIDELINE = N/A		
1992 AUG	.170 <T	.240 <T	.220 <T		
1992 SEP		.370 <T	.330 <T	.350 <T	
1992 OCT	BDL	BDL	.490 <T	.530 <T	
1992 NOV		.120 <T	.060 <T	.070 <T	
1992 DEC	.280 <T	.320 <T	.240 <T	.280 <T	
CHROMIUM (UG/L)					
		DET'N LIMIT = 0.50	GUIDELINE = 50.0 (A1)		
1992 AUG	5.100	4.200 <T	1.700 <T		
1992 SEP		1.100 <T	1.000 <T	.960 <T	
1992 OCT	4.200 <T	BDL	2.400 <T	1.200 <T	
1992 NOV		8.200	1.400 <T	1.100 <T	
1992 DEC	.980 <T	1.900 <T	2.900 <T	2.900 <T	
COPPER (UG/L)					
		DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)		
1992 AUG	1.100 <T	1.500 <T	57.000		
1992 SEP		BDL	54.000	530.000	
1992 OCT	BDL	BDL	480.000	470.000	
1992 NOV		.530 <T	33.000	410.000	
1992 DEC	.640 <T	.620 <T	67.000	710.000	
IRON (UG/L)					
		DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)		
1992 AUG	140.000	150.000	150.000		
1992 SEP		150.000	140.000	140.000	
1992 OCT	280.000	130.000	120.000	120.000	
1992 NOV		130.000	190.000	140.000	
1992 DEC	170.000	93.000	100.000	79.000	
MERCURY (UG/L)					
		DET'N LIMIT = 0.02	GUIDELINE = 1.0 (A1)		
1992 AUG	BDL	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
METALS							
MANGANESE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)		
1992 AUG	18.000				50.000	.100 <T	
1992 SEP				14.000			.070 <T
1992 OCT		23.000	6.500		44.000	BDL	
1992 NOV	18.000		8.600	14.000			
1992 DEC		18.000			43.000	.110 <T	
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = N/A		
1992 AUG	.640				.770	.240 <T	
1992 SEP		1.200	.640	.580			.270 <T
1992 OCT			1.400		.910	.340 <T	
1992 NOV	.590		.600	.540			
1992 DEC		.890			.730	.290 <T	
NICKEL (UG/L)			DET'N LIMIT = 0.20		GUIDELINE = 350 (D3)		
1992 AUG	BDL				BDL	BDL	
1992 SEP		.250 <T		1.100 <T	.760 <T		.580 <T
1992 OCT			BDL			BDL	
1992 NOV	BDL		BDL	BDL			
1992 DEC		BDL			BDL	BDL	
LEAD (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)		
1992 AUG	.170 <T				.210 <T	BDL	
1992 SEP		.130 <T		.430 <T	.130 <T		.070 <T
1992 OCT			.400 <T		.220 <T	BDL	
1992 NOV	.330 <T			.490 <T	.090 <T		
1992 DEC		.560			.100 <T	.160 <T	
ANTIMONY (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 146 (D4)		
1992 AUG	.260 <T				.330 <T	.280 <T	
1992 SEP		.540		.530	.460 <T		.510
1992 OCT			.390 <T		.430 <T	.490 <T	
1992 NOV	.440 <T			.510	.410 <T		
1992 DEC		.410 <T			.520	.450 <T	
SELENIUM (UG/L)			DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)		
1992 AUG	BDL				BDL	BDL	
1992 SEP		BDL		BDL			BDL
1992 OCT			BDL		1.400 <T	1.100 <T	
1992 NOV	BDL			BDL			
1992 DEC		BDL			BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
METALS				
MANGANESE (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)	
1992 AUG	20.000	19.000	18.000	.
1992 SEP	46.000	18.000	17.000	17.000
1992 OCT	.	17.000	15.000	15.000
1992 NOV	43.000	24.000	31.000	36.000
1992 DEC	21.000	19.000	18.000	13.000
MOLYBDENUM (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = N/A	
1992 AUG	.820	.690	.740	.
1992 SEP	.720	.810	.790	.800
1992 OCT	1.000	.760	.710	.750
1992 NOV	.710	.890	.530	.490 <T
1992 DEC	.950	.990	.890	.860
NICKEL (UG/L)	DET'N LIMIT = 0.20		GUIDELINE = 350 (D3)	
1992 AUG	BDL	BDL	BDL	.
1992 SEP	.360 <T	1.400 <T	1.000 <T	1.600 <T
1992 OCT	BDL	BDL	3.500	3.900
1992 NOV	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL
LEAD (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)	
1992 AUG	.070 <T	.210 <T	.280 <T	.
1992 SEP	.	.260 <T	.330 <T	.
1992 OCT	.070 <T	.100 <T	1.200	2.200
1992 NOV	.160 <T	.540	.350 <T	1.200
1992 DEC	.460 <T	.450 <T	.650	.590
ANTIMONY (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = 146 (D4)	
1992 AUG	.350 <T	.250 <T	.210 <T	.
1992 SEP	.470 <T	.480 <T	.400 <T	.760
1992 OCT	.490 <T	.350 <T	.460 <T	.490 <T
1992 NOV	.400 <T	.330 <T	.340 <T	.420 <T
1992 DEC	.450 <T	.340 <T	.460 <T	.570
SELENIUM (UG/L)	DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)	
1992 AUG	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	BDL	BDL
1992 OCT	BDL	1.100 <T	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL
1992 DEC	1.400 <T	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
METALS							
STRONTIUM (UG/L)							
		DET'N LIMIT = 0.10	GUIDELINE = N/A				
1992 AUG	170.000				900.000	150.000	
1992 SEP			530.000	380.000			150.000
1992 OCT	280.000	330.000			920.000	150.000	
1992 NOV			520.000	320.000			
1992 DEC	230.000				980.000	160.000	
TITANIUM (UG/L)							
		DET'N LIMIT = 0.50	GUIDELINE = N/A				
1992 AUG	18.000				23.000	18.000	
1992 SEP			11.000	13.000			11.000
1992 OCT	11.000	20.000			21.000	18.000	
1992 NOV			10.000	11.000			
1992 DEC	18.000				17.000	16.000	
THALLIUM (UG/L)							
		DET'N LIMIT = 0.05	GUIDELINE = 13 (04)				
1992 AUG	BDL				BDL	BDL	
1992 SEP			BDL	BDL			BDL
1992 OCT		BDL			BDL	BDL	
1992 NOV	BDL		BDL	BDL			
1992 DEC					BDL	BDL	
URANIUM (UG/L)							
		DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)				
1992 AUG	.200 <T				1.100	.370 <T	
1992 SEP			.520	.240 <T			.380 <T
1992 OCT	.280 <T	.290 <T			1.000	.450 <T	
1992 NOV	.230 <T		.470 <T	.280 <T			
1992 DEC	.280 <T				.760	.320 <T	
VANADIUM (UG/L)							
		DET'N LIMIT = 0.05	GUIDELINE = N/A				
1992 AUG	BDL				.140 <T	.210 <T	
1992 SEP			BDL	BDL			BDL
1992 OCT		BDL			.090 <T	.160 <T	
1992 NOV	BDL		BDL	BDL			
1992 DEC					BDL	BDL	
ZINC (UG/L)							
		DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)				
1992 AUG	5.100				10.000	4.300	
1992 SEP			17.000	4.300			12.000
1992 OCT	4.300	5.500			8.000	3.100	
1992 NOV			14.000	2.800			
1992 DEC	2.700				8.500	3.900	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
METALS				
STRONTIUM (UG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = N/A	
1992 AUG	390.000	190.000	200.000	.
1992 SEP	.	200.000	200.000	200.000
1992 OCT	650.000	200.000	200.000	200.000
1992 NOV	600.000	270.000	450.000	380.000
1992 DEC	400.000	260.000	240.000	260.000
TITANIUM (UG/L)				
		DET'N LIMIT = 0.50	GUIDELINE = N/A	
1992 AUG	19.000	22.000	23.000	.
1992 SEP	.	11.000	11.000	12.000
1992 OCT	11.000	25.000	22.000	22.000
1992 NOV	9.000	12.000	8.300	8.900
1992 DEC	14.000	24.000	24.000	24.000
THALLIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 13 (04)	
1992 AUG	BDL	BDL	BDL	.
1992 SEP	.	.060 <T	.070 <T	BDL
1992 OCT	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL
URANIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)	
1992 AUG	.730	.190 <T	.230 <T	.
1992 SEP	.	.300 <T	.220 <T	.280 <T
1992 OCT	.740	.240 <T	.240 <T	.230 <T
1992 NOV	.	.270 <T	.340 <T	.350 <T
1992 DEC	.700	.230 <T	.280 <T	.250 <T
VANADIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = N/A	
1992 AUG	.080 <T	.060 <T	BDL	BDL
1992 SEP	.	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL
1992 NOV	.	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL
ZINC (UG/L)				
		DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)	
1992 AUG	6.900	8.600	10.000	.
1992 SEP	.	8.200	9.500	43.000
1992 OCT	6.000	7.800	43.000	42.000
1992 NOV	4.300	11.000	13.000	15.000
1992 DEC	6.500	8.000	12.000	34.000

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHLOROAROMATICS							
HEXACHLOROBUTADIENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 450 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
123-TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1234-TETCHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1235-TETCHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
124-TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = 10000 (I)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1245-TETCHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 38000 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
135-TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEXACHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 10 (C1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 1900 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
OCTACHLOROSTYRENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PENTACHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 74000 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
236-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHLOROAROMATICS				
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (D4)
BDL	BDL	BDL	BDL	BDL
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
1234-TETChlorobenzene (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
1235-TETChlorobenzene (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (I)
BDL	BDL	BDL	BDL	BDL
1245-TETChlorobenzene (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (D4)
BDL	BDL	BDL	BDL	BDL
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)
BDL	BDL	BDL	BDL	BDL
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 1900 (D4)
BDL	BDL	BDL	BDL	BDL
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 74000 (D4)
BDL	BDL	BDL	BDL	BDL
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
CHLOROAROMATICS							
245-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26A-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
CHLOROAROMATICS				
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A	
BDL	BDL	BDL	BDL	BDL
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A	
BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
PESTICIDES AND PCB							
ALDRIN (NG/L )			DET'N LIMIT = 1.000	GUIDELINE = 700 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA BHC (NG/L )			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BETA BHC (NG/L )			DET'N LIMIT = 1.00	GUIDELINE = 300 (G)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
LINDANE (GAMMA BHC) (NG/L )			DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA CHLORDANE (NG/L )			DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
GAMMA CHLORDANE (NG/L )			DET'N LIMIT = 2.00	GUIDELINE = 7000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DIELDRIN (NG/L )			DET'N LIMIT = 2.00	GUIDELINE = 700 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METHOXYCHLOR (NG/L )			DET'N LIMIT = 5.0	GUIDELINE = 900000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN I (NG/L )			DET'N LIMIT = 2.00	GUIDELINE = 74000 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN II (NG/L )			DET'N LIMIT = 5.000	GUIDELINE = 74000 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDRIN (NG/L )			DET'N LIMIT = 5.000	GUIDELINE = 1600 (D3)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN SULPHATE (NG/L )			DET'N LIMIT = 5.00	GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
PESTICIDES AND PCB				
ALDRIN (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 700 (A1)
	BDL	BDL	BDL	BDL
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 700 (G)
	BDL	BDL	BDL	BDL
BETA BHC (NG/L)		DET'N LIMIT = 1.00		GUIDELINE = 300 (G)
	BDL	BDL	BDL	BDL
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 4000 (A1)
	BDL	BDL	BDL	BDL
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000		GUIDELINE = 7000 (A1)
	BDL	BDL	BDL	BDL
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 7000 (A1)
	BDL	BDL	BDL	BDL
DIELDRIN (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 700 (A1)
	BDL	BDL	BDL	BDL
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 900000 (A1)
	BDL	BDL	BDL	BDL
ENDOSULFAN I (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 74000 (04)
	BDL	BDL	BDL	BDL
ENDOSULFAN II (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 74000 (04)
	BDL	BDL	BDL	BDL
ENDRIN (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 1600 (03)
	BDL	BDL	BDL	BDL
ENDOSULFAN SULPHATE (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = N/A
	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
PESTICIDES AND PCB							
HEPTACHLOR EPOXIDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEPTACHLOR (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MIREX (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
OXYCHLORDANE (NG/L )		DET'N LIMIT = 2.000		GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PCB (NG/L )		DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDD (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOXAPHENE (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AMETRINE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 300000 (D3)			
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ATRAZINE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)			
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
PESTICIDES AND PCB				
HEPTACHLOR EPOXIDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)
BDL	BDL	BDL	BDL	BDL
HEPTACHLOR (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)
BDL	BDL	BDL	BDL	BDL
MIREX (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
OXYCHLORDANE (NG/L )		DET'N LIMIT = 2.000		GUIDELINE = N/A
BDL	BDL	BDL	BDL	BDL
O,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)
BDL	BDL	BDL	BDL	BDL
PCB (NG/L )		DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)
BDL	BDL	BDL	BDL	BDL
P,P-DDD (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)
BDL	BDL	BDL	BDL	BDL
P,P-DDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)
BDL	BDL	BDL	BDL	BDL
P,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)
BDL	BDL	BDL	BDL	BDL
TOXAPHENE (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)
BDL	BDL	BDL	BDL	BDL
AMETRINE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 300000 (03)
BDL	BDL	BDL		
ATRAZINE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)
BDL	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
PESTICIDES AND PCB							
ATRAZONE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 10000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 60000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 10000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PROMETONE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 52500 (D3)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PROPACINE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 700000 (D3)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PROMETRYNE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 1000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METRIBUZIN (SENCOR) (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 80000 (A1)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SIMAZINE (NG/L)		DET'N LIMIT = 50.00	GUIDELINE = 10000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METOLACHLOR (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)				
26 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

TABLE 4

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
PESTICIDES AND PCB				
ATRATONE (NG/L)	BDL	DET'N LIMIT = 50.0	GUIDELINE = N/A	
CYANAZINE (BLADEX) (NG/L)	BDL	DET'N LIMIT = 100.0	GUIDELINE = 10000 (A2)	
DESETHYL ATRAZINE (NG/L)	BDL	DET'N LIMIT = 200.0	GUIDELINE = 60000 (A2)	
DESETHYL SIMAZINE (NG/L)	BDL	DET'N LIMIT = 200.0	GUIDELINE = 10000 (A2)	
PROMETONE (NG/L)	BDL	DET'N LIMIT = 50.000	GUIDELINE = 52500 (D3)	
PROPACAZINE (NG/L)	BDL	DET'N LIMIT = 50.000	GUIDELINE = 700000 (D3)	
PROMETRYNE (NG/L)	BDL	DET'N LIMIT = 50.000	GUIDELINE = 1000 (A2)	
METRIBUZIN (SENCOR) (NG/L)	BDL	DET'N LIMIT = 100.0	GUIDELINE = 80000 (A1)	
SIMAZINE (NG/L)	BDL	DET'N LIMIT = 50.00	GUIDELINE = 10000 (A2)	
ALACHLOR (LASSO) (NG/L)	BDL	DET'N LIMIT = 500.0	GUIDELINE = 5000 (A2)	
METOLACHLOR (NG/L)	BDL	DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
PHENOLICS							
1992 AUG	BDL						
1992 SEP	BDL		.800 <T	1.000 <T	BDL	BDL	BDL
1992 OCT		BDL			.400 <T	BDL	
1992 NOV	BDL		BDL	BDL			
1992 DEC	BDL				BDL	BDL	

DET'N LIMIT = 0.2

GUIDELINE = N/A

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
PHENOLICS				
PHENOLICS (UG/L)		DET'N LIMIT =	0.2	GUIDELINE = N/A
1992 AUG	.400 <T	BDL	.	.
1992 SEP	.	BDL	.	.
1992 OCT	BDL	BDL	.	.
1992 NOV	.	BDL	.	.
1992 DEC	BDL	BDL	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A
		BDL	BDL	
ANTHRACENE (NG/L )		DET'N LIMIT = 1.0		GUIDELINE = N/A
		BDL	BDL	
FLUORANTHENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)
		BDL	BDL	
PYRENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(A)ANTHRACENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A
		BDL	BDL	
CHRYSENE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = N/A
		BDL	BDL	
DIMETH. BENZ(A)ANTHR (NG/L )		DET'N LIMIT = 5.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(E) PYRENE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(B) FLUORANTHENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A
		BDL	BDL	
PERYLENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(K) FLUORANTHENE (NG/L )		DET'N LIMIT = 1.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(A) PYRENE (NG/L )		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)
		BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
POLYAROMATIC HYDROCARBONS				
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
		BDL	BDL	
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
		BDL	BDL	
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
		BDL	BDL	
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A
		BDL	BDL	
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
		BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
VOLATILES							
BENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOLUENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)			
1992 AUG	BDL				BDL	BDL	
1992 SEP					BDL		BDL
1992 OCT		.100 <T			.100 <T	.050 <T	
1992 NOV	BDL		.050 <T	BDL			
1992 DEC		.100 <T			.100 <T	.100 <T	
P-XYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
M-XYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O-XYLENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
STYRENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)			
1992 AUG	BDL				BDL	BDL	.050 <T
1992 SEP			.050 <T	.050 <T			
1992 OCT		.150 <T			.100 <T	.100 <T	
1992 NOV	BDL		.050 <T	BDL			
1992 DEC		.150 <T			.200 <T	.200 <T	
1,1-DICHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.100	GUIDELINE = 7 (D1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METHYLENE CHLORIDE (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
T12-DICHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 70 (D1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
VOLATILES				
BENZENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)
	BDL	BDL	BDL	
TOLUENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 24 (A3)
	BDL	BDL	BDL	
ETHYLBENZENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 2.4 (A3)
1992 AUG	BDL	BDL	BDL	
1992 SEP	BDL	BDL	.100 <T	
1992 OCT	.100 <T	.100 <T	.050 <T	
1992 NOV	BDL	.050 <T	BDL	
1992 DEC	.100 <T	.100 <T	.100 <T	
P-XYLENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)
	BDL	BDL	BDL	
M-XYLENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)
	BDL	BDL	BDL	
O-XYLENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)
	BDL	BDL	BDL	
STYRENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)
1992 AUG	BDL	BDL	BDL	
1992 SEP	.050 <T	BDL	.200 <T	
1992 OCT	.150 <T	BDL	.050 <T	
1992 NOV	BDL	BDL	BDL	
1992 DEC	.150 <T	BDL	.150 <T	
1,1-DICHLOROETHYLENE (UG/L )		DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)
	BDL	BDL	BDL	
METHYLENE CHLORIDE (UG/L )		DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)
	BDL	BDL	BDL	
T12-DICHLOROETHYLENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)
	BDL	BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
VOLATILES							
1,1-DICHLOROETHANE (UG/L )							
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHLOROFORM (UG/L )							
1992 AUG	BDL	.	.	.	BDL	.200 <T	.
1992 SEP	.	.	.	BDL	.	.	.300 <T
1992 OCT	.	BDL	.	.	BDL	BDL	.
1992 NOV	BDL	.	BDL	BDL	.	.	.
1992 DEC	.	BDL	.	.	BDL	BDL	.
111, TRICHLOROETHANE (UG/L )							
1992 AUG	BDL	.	.	.	BDL	BDL	.
1992 SEP	.	.	.	BDL	.	BDL	.
1992 OCT	.	BDL	.	BDL	BDL	BDL	.
1992 NOV	BDL	.	.	BDL	.	.	.
1992 DEC	.	BDL	.	.	BDL	.040 <T	.
1,2 DICHLOROETHANE (UG/L )							
1992 AUG	BDL	.	.	.	BDL	BDL	.
1992 SEP	.	.	.	BDL	.	BDL	.
1992 OCT	.	BDL	.	BDL	BDL	BDL	.
1992 NOV	BDL	.	.	BDL	.	.	.
1992 DEC	.	BDL	.	.	BDL	.050 <T	.
CARBON TETRACHLORIDE (UG/L )							
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-DICHLOROPROPANE (UG/L )							
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TRICHLOROETHYLENE (UG/L )							
1992 AUG	BDL	.	.	.	3.600	BDL	.
1992 SEP	.	.	.	BDL	.	.	BDL
1992 OCT	.	BDL	.	.	1.900	BDL	.
1992 NOV	BDL	.	.	BDL	.	.	.
1992 DEC	.	BDL	.	.	1.300	BDL	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
VOLATILES				
1,1-DICHLOROETHANE (UG/L )				
BDL	BDL	BDL	BDL	BDL
			DET'N LIMIT = 0.100	GUIDELINE = N/A
CHLOROFORM (UG/L )				
BDL	BDL	BDL	BDL	BDL
			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
1992 AUG	BDL	3.600	1.300	.
1992 SEP	BDL	1.900	.900 <T	.
1992 OCT	BDL	3.400	1.500	.
1992 NOV	BDL	2.900	.400 <T	.
1992 DEC	BDL	2.700	1.000 <T	.
111, TRICHLOROETHANE (UG/L )				
BDL	BDL	BDL	BDL	BDL
			DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)
1992 AUG	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 NOV	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.
1,2 DICHLOROETHANE (UG/L )				
BDL	BDL	BDL	BDL	.
			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
1992 AUG	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 NOV	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.
CARBON TETRACHLORIDE (UG/L )				
BDL	BDL	BDL	BDL	.
			DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)
1,2-DICHLOROPROPANE (UG/L )				
BDL	BDL	BDL	BDL	.
			DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)
TRICHLOROETHYLENE (UG/L )				
BDL	BDL	BDL	BDL	.
			DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)
1992 AUG	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 NOV	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
VOLATILES							
DICHLOROBROMOMETHANE (UG/L )							
			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)			
1992 AUG	BDL				BDL	BDL	
1992 SEP				BDL			BDL
1992 OCT			BDL		BDL	BDL	
1992 NOV	BDL			BDL			
1992 DEC					BDL	BDL	
112-TRICHLOROETHANE (UG/L )							
			DET'N LIMIT = 0.05	GUIDELINE = 0.6 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHLORODIBROMOMETHANE (UG/L )							
			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)			
1992 AUG	BDL				BDL	BDL	
1992 SEP				BDL			BDL
1992 OCT			BDL		BDL	BDL	
1992 NOV	BDL			BDL			
1992 DEC					BDL	BDL	
TETRACHLOROETHYLENE (UG/L )							
			DET'N LIMIT = 0.05	GUIDELINE = 65 (A5)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BROMOFORM (UG/L )							
			DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1122-TETRACHLOROETHANE (UG/L )							
			DET'N LIMIT = 0.05	GUIDELINE = 0.17 (D4)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
VINYL CHLORIDE (UG/L )							
			DET'N LIMIT = 0.100	GUIDELINE = 2 (D1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C12-DICHLOROETHYLENE (UG/L )							
			DET'N LIMIT = 0.100	GUIDELINE = 70 (D1)			
1992 AUG	BDL				BDL	BDL	
1992 SEP				BDL			BDL
1992 OCT			BDL		BDL	BDL	
1992 NOV	BDL			BDL			
1992 DEC					BDL	BDL	
CHLOROBENZENE (UG/L )							
			DET'N LIMIT = 0.10	GUIDELINE = 1510 (D3)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING	
VOLATILES					
DICHLOROBROMOMETHANE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
1992 AUG	BDL	2.300	1.100	.	.
1992 SEP	BDL	1.650	1.000	.	.
1992 OCT	BDL	2.750	1.400	.	.
1992 NOV	BDL	2.150	.300 <T	.	.
1992 DEC	BDL	2.150	1.000	.	.
112-TRICHLOROETHANE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 0.6 (04)	
BDL	BDL	BDL	BDL	.	.
CHLORODIBROMOMETHANE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1992 AUG	BDL	1.400	.800 <T	.	.
1992 SEP	BDL	1.200	.700 <T	.	.
1992 OCT	BDL	1.800	1.100	.	.
1992 NOV	BDL	1.400	BDL	.	.
1992 DEC	BDL	1.300	.800 <T	.	.
TETRACHLOROETHYLENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 65 (A5)	
BDL	BDL	BDL	BDL	.	.
BROMOFORM (UG/L )		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
BDL	BDL	BDL	BDL	.	.
1122-TETACHLOROETHANE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 0.17 (04)	
BDL	BDL	BDL	BDL	.	.
VINYL CHLORIDE (UG/L )		DET'N LIMIT = 0.100		GUIDELINE = 2 (D1)	
BDL	BDL	BDL	BDL	.	.
C12-DICHLOROETHYLENE (UG/L )		DET'N LIMIT = 0.100		GUIDELINE = 70 (D1)	
1992 AUG	BDL	BDL	BDL	.	.
1992 SEP	BDL	BDL	BDL	.	.
1992 OCT	BDL	BDL	BDL	.	.
1992 NOV	BDL	BDL	BDL	.	.
1992 DEC	BDL	BDL	BDL	.	.
CHLOROBENZENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 1510 (03)	
BDL	BDL	BDL	BDL	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
VOLATILES							
1,4-DICHLOROBENZENE (UG/L)							
		DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-DICHLOROBENZENE (UG/L)							
		DET'N LIMIT = 0.10	GUIDELINE = 3750 (D3)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-DICHLOROBENZENE (UG/L)							
		DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ETHYLENE DIBROMIDE (UG/L)							
		DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOTL TRIHALOMETHANES (UG/L)							
		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)				
1992 AUG	BDL						
1992 SEP	BDL		BDL	BDL	BDL	BDL	BDL
1992 OCT		BDL					
1992 NOV	BDL		BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL				BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
VOLATILES				
1,4-DICHLOROBENZENE (UG/L)	BDL	BDL	DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)
1,3-DICHLOROBENZENE (UG/L)	BDL	BDL	DET'N LIMIT = 0.10	GUIDELINE = 3750 (D3)
1,2-DICHLOROBENZENE (UG/L)	BDL	BDL	DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)
ETHYLENE DIBROMIDE (UG/L)	BDL	BDL	DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)
TOTL TRIHALOMETHANES (UG/L)	BDL	BDL	DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
1992 AUG	BDL	7.300	3.200 <T	.
1992 SEP	BDL	4.750 <T	2.600 <T	.
1992 OCT	BDL	7.950	4.000 <T	.
1992 NOV	BDL	6.450	.700 <T	.
1992 DEC	BDL	6.150	2.800 <T	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 8A RAW	WELL 8B RAW	WELL 8C RAW	WELL 2 PRETREATED	WELL 3 PRETREATED	WELL 4 PRETREATED	WELL 5 PRETREATED	WELL 5A PRETREATED
RADIONUCLIDES							
COBALT 60 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A				
10 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	
CESIUM 134 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A				
10 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	
CESIUM 137 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)				
10 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	
GROSS ALPHA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)				
1992 OCT		.090			.090	.090	
1992 NOV	.060		.070	.040			
1992 DEC	BDL						
GROSS BETA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = N/A				
1992 OCT		.040			.080	.050	
1992 NOV	BDL		.050	.040			
1992 DEC	BDL						
TRITIUM (BQ/L)		DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)				
10 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	
IODINE 131 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)				
10 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 ORANGEVILLE WELL SUPPLY

WELL 6 PRETREATED	WELL 7 PRETREATED	RESERVOIR TREATED	DIST. SYSTEM KENSINGTON PL FREE FLOW	DIST. SYSTEM KENSINGTON PL STANDING
RADIONUCLIDES				
COBALT 60 (BQ/L)	BDL	BDL	DET'N LIMIT = 0.70	GUIDELINE = N/A
CESIUM 134 (BQ/L)	BDL	BDL	DET'N LIMIT = 0.70	GUIDELINE = N/A
CESIUM 137 (BQ/L)	BDL	BDL	DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)
GROSS ALPHA COUNT (BQ/L)	BDL	BDL	DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)
1992 OCT	.110	.070		
1992 NOV	.060			
GROSS BETA COUNT (BQ/L)	BDL	BDL	DET'N LIMIT = 0.04	GUIDELINE = N/A
1992 OCT	.050	.060		
1992 NOV	BDL			
TRITIUM (BQ/L)	BDL	BDL	DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)
IODINE 131 (BQ/L)	BDL	BDL	DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)

#### METALS

ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)

#### POLYNUCLEAR AROMATIC HYDROCARBONS

ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A

#### PESTICIDES & PCB

ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADIX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
-----	-----	-----	-----
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

# Equal to 15.0 Picocuries/litre



DRINKING WATER SURVEILLANCE PROGRAM  
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

## DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

## PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

### Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

#### 1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

#### 2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

#### 3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

#### 4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

#### 5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

## 6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

## 7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

### Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

### Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

#### Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

#### Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

#### Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

#### Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

#### Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

**NAME:** BENZENE

**CAS#:** 71-43-2

**MOLECULAR FORMULAE:**  $C_6H_6$

**DETECTION LIMIT:** (FOR METHOD POCODO) 0.05  $\mu g/L$

**SYNONYMS:** BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)  
CYCLOHEXATRIENE (41)

**CHARACTERISTICS:** COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)

**PROPERTIES:** SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)  
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER  
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)  
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)

**SOURCES:** COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.  
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

**USES:** DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

**REMOVAL:** THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

**ADDITIONAL PROPERTIES:** MOLECULAR WEIGHT: 78.12  
MELTING POINT: 5.5°C (27)  
BOILING POINT: 80.1°C (27)  
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)  
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)  
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)  
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)  
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)  
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA



DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate.
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide ( $\text{NaOH}$ ) (Caution: $\text{NaOH}$ is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid ( $\text{HNO}_3$ ) and potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) (Caution: $\text{HNO}_3$ & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii). Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid $\text{HNO}_3$ (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.





